THE OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

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CONTENTS.

PAGE
Sizes and Capacities of Cylinders 2
Compressing Oxygen at Home 2
Aphengescopes and Vertical Attachments in One 3
Condensers and Experiments with the Lantern 4
To Obtain Various Colours on Lantern Plates 5
How to Make a Lime-light Box 6
The Lantern as applied to Medicine 7
How to Get, Please, and Retain an Audience 7
Autotype Lantern Slides 9
Oxygen Good and Bad 10
My First Exhibition 12
The Lantern of the Future 13
Lanternists in Australia 15
Editorial Table 15
Correspondence—
  Lantern Slides of Life and Character 16
  Measuring Oxygen 16
Notes and Queries 16

Notices.

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NOTICE.

Many Correspondents still forward their Communications to the Old Address. Will they please note that Our Address is now

56, CHANCERY LANE, LONDON, W.C.

Notes.

A Happy New Year to All.

* * *

Mr. Thomas Bolas (editor "Photographic Work"), in commenting on our article in last issue, "Old Coal Gas," says, in explanation of the deposits we described, "that iron and carbon monoxide slowly unite together, forming the curious volatile compound iron carbonyl, and when the contaminated gas is burned, oxide of iron is formed as a deposit on the limes, the light being consequently reduced to a fraction of what it should be."

* * *

With this issue we commence a series of articles upon "How to Get, Please, and Maintain an Audience." These articles are written by Mr. E. Baker, of Salisbury, a practical and consulting lanternist of nearly thirty years' experience, so our readers will doubtless learn many hints in connection with lantern entertainments.

* * *

At the Lantern Society, 20, Hanover Square, a lecture of particular interest will be given on Monday, 23rd inst., at 8 p.m. precisely, by Mr. C. Goodwin Norton on the practical management of a triple lantern, including various means of obtaining incandescence with different makes of oxygen, the registration of effects, &c. We understand that Mr. Norton is to use five lanterns, and intends to illustrate the lecture very fully. It is expected that a large audience will be present. We shall be pleased to send tickets to any of our readers on receipt of a stamped envelope.

We have to congratulate Miss Catherine Weed Barnes, of New York, and Mr. H. Snowden Ward, of London. We understand that Mr. Ward (editor of "Practical Photographer") starts for New York July 1st, and that the honeymoon will be spent in Chicago.

* * *

Mr. Hughes, of Kingsland, is at present engaged on a book, which will shortly be published. The subject is, "How to Choose, What to Avoid, and How to Use Lanterns."

* * *

We learn that Cheffin's Fantoccini slides, described in our issue of April, 1891, are now being manufactured and introduced by Messrs. Ottway and Son, of Islington.

* * *

At a recent lantern entertainment at Westminster the show came to a somewhat abrupt close. The rev. lecturer had just said, "I will now show you, my boys, what Robinson Crusoe's disobedience brought about"—when by some unexplained means the lantern was toppled over, and fell from its stand to the floor. The gas connections being broken, the gas escaping from the cylinder made a noise that somewhat frightened the juvenile audience; but lights were obtained, and peace speedily restored.

* * *

The offices of our contemporary *Pacific Coast Photographer* (San Francisco), have been removed from 27, Main Street, to 408, Sacramento Street.

* * *

The medals awarded in the Photographic Competition (Stanley Show), will be presented on the 9th inst., at Wortley Hall, Seven Sisters Road. A musical evening will be held. Invitation tickets can be obtained on application from Mr. Herbert Smith, 29, Finsbury Pavement, or Mr. W. Goddard, 261, Seven Sisters Road, N.

—:o:—

Sizes and Capacity of Cylinders.

The following particulars cannot fail to be of interest to all lanternists. The cylinders spoken of are usually tested to about 4,000 lbs. to the square inch, and contain gas compressed to 120 atmospheres.

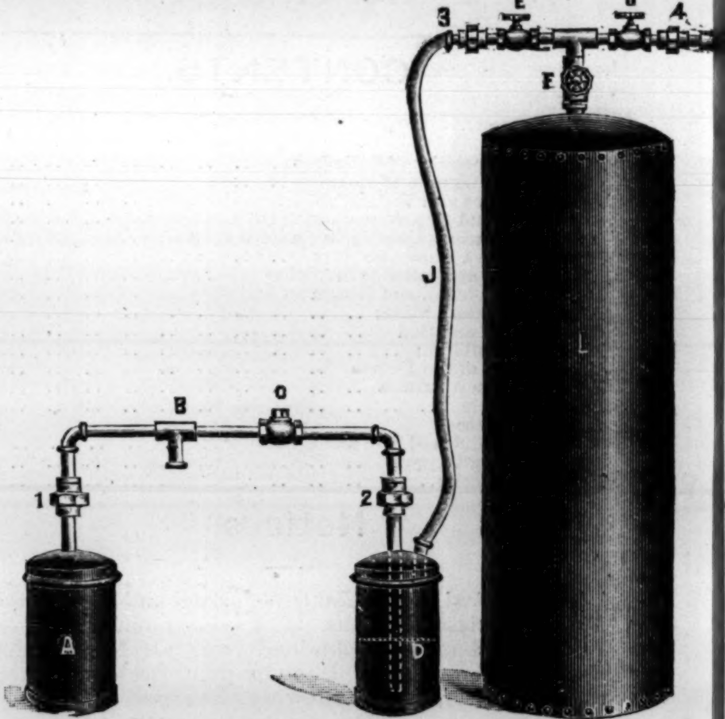
A Cylinder containing

5	Cubic feet will measure	3½	in.	×	14 in.
6	,, ,,	3½	,,	×	16 ,,
10	,, ,,	4	,,	×	21½ ,,
15	,, ,,	4	,,	×	26½ ,,
20	,, ,,	4	,,	×	31½ ,,
40	,, ,,	5½	,,	×	35½ ,,
80	,, ,,	7	,,	×	40 ,,
100	,, ,,	7	,,	×	50 ,,

Compressing Oxygen at Home.

With a gas bottle of the type much used in America, it is not a difficult matter for anyone to make, and compress oxygen in sufficient quantities to supply the requirements of an entertainment of several hours duration.

No pump is required with an apparatus which has been invented by Mr. Arnold, and introduced by the McIntosh Optical Company of Chicago. The oxygen undergoes compression at the same time that it is being generated.



The cylinder I measures 42 inches in height, and has a diameter of 12 inches. This with gas compressed to 100 lbs. to the square inch will contain between 18 and 19 feet.

In the retort A is placed 3 lbs potassium chlorate and 1 lb. black binoxide of manganese. This is introduced at the union 1. The wash bottle D having been half filled with water containing two teaspoonfuls of carbonate of soda is attached at the union 2. A piece of flexible high pressure steam hose J extends from the wash bottle to the cylinder.

When heat is applied to A as by placing it on a fire or gas stove, oxygen will be given off, and pass into the wash bottle D with a bubbling sound, and after the lapse of a minute or two, to ensure the hot-air passing off at the end of the tubing J, connection may be made with the bottle or gas container by screwing up the union 3.

Having ascertained that the globe valves E, F and G are open, the gas that is being generated will find its way into the cylinder I and to the gauge H, and by the time the mixture that was placed in the retort has been exhausted, a pressure of about 65 lbs. should be indicated by the gauge. The cessation of gas being generated will be apparent by the stoppage of the bubbling sound in the washing bottle, when the valve F should be closed.

The retort may then again be charged, first disconnecting the union 1, and washing out with water whilst warm, and then placing in it about one half of the previous charge, and heating as before. The valves E and G are allowed to be open, but F closed until the pressure indicated on the gauge indicates a little more than that shown as being the contents of the cylinder (say 68 or 70 lbs). The valve F is now opened and the cylinder allowed to fill until about 100 lbs. are represented on the gauge.

In order to relieve any sudden pressure that may occur, a "blow-out" is placed at B. This consists of a thin metallic disc which will bend and blow-out at a pressure of 200 lbs. to the square inch.

Should there by any means be a greater pressure of gas at the cylinder than at the retort there would be a tendency to force the water from the wash bottle D into the hot retort, but as this would be decidedly undesirable, a check valve C is placed on the tube between the retort and the washing bottle. This valve will allow of a free passage from the retort, but immediately closes with the slightest back pressure.

When the cylinder is filled it is disconnected at the T piece, and into its place is screwed the necessary connections for the lanterns.

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Aphengescope and Vertical Attachment in One.

By Claud S. Scott.

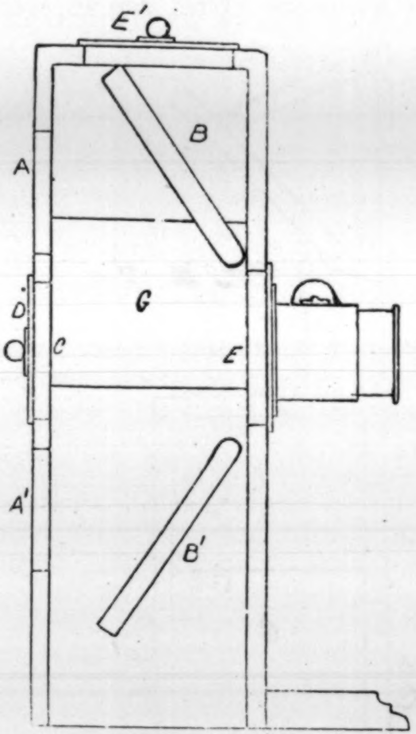
I have read with interest and profit the article on aphengescopes which appeared in the November number of *The Optical Magic Lantern Journal*, and have pleasure in giving a description of a special form of aphengescope which I have in use.

This form answers the double purpose of an aphengescope for a bi-unial lantern, and also a vertical attachment. Having found it very useful I will give such details as will enable any mechanically-inclined readers to construct it for themselves.

The apparatus consists of a rectangular wooden box with a base board attached, open at the bottom.

At the back are two circular holes, shown at A A, Figs. 1 and 2, to receive the nozzles of a bi-unial lantern (not shown), which is placed at the back of the apparatus.

When used as an aphengescope (Fig. 1), the two mirrors, B B^1, are placed opposite the openings, A A^1, as shown; the mirrors are hung upon pins, and can be set at the proper angle by means of set screws working in radial slots on the right-hand side of the apparatus. These mirrors reflect the light from the lantern upon the object, C, which is held by a carrier on the small door, D, at the back of the apparatus.



The objective is screwed into a flange on another door, E, on the front, and opposite the object C.

When used as a vertical attachment (Fig. 2), the condenser, F, from the top lantern is placed in a suitable frame above the bottom mirror, B^1, (this frame can be removed when the apparatus is used as an aphengescope), the mirror is then adjusted so as to reflect the light from the bottom lantern through the condenser, F. The object, C, being placed on a glass stage plate immediately above the condenser, F.

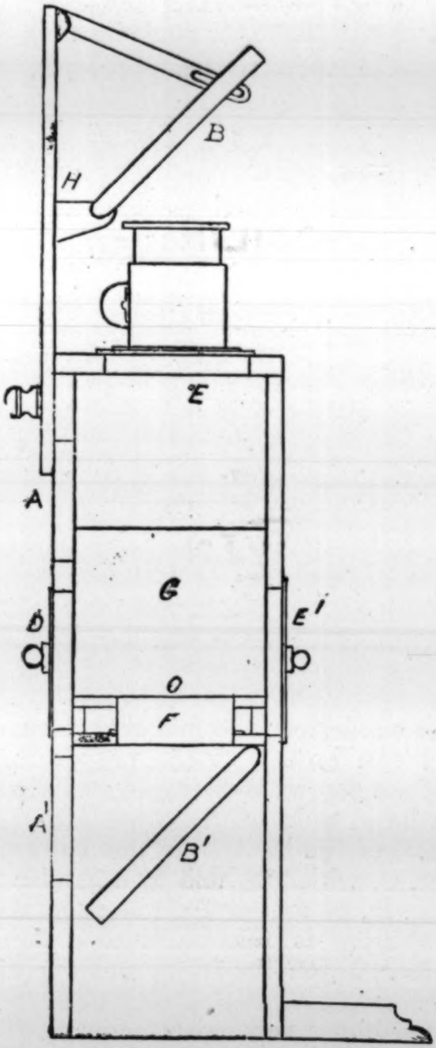
At the sides of the apparatus are doors, G G, which can, if necessary, be removed, leaving an opening for any object to be placed upon the glass stage plate.

The door E (Fig. 1), with the objective is removed, and placed at the top as shown (Fig. 2), its place being filled with the door E^1, which is made interchangeable with it.

264

The top mirror, B (Fig. 1), is removed, and supported by a frame, H (Fig. 2), above the objective, and can be adjusted so as to throw the image of the object upon a screen placed in front.

The frame, H, is secured to the back of the apparatus by means of set screws, working in slots, so that the mirror can be either raised or lowered as required. When using the vertical attachment I find I get better results by removing the condenser from the bottom lantern, and placing it in the lower circular hole, A^1, which is made large enough to receive it.



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A man has to be skilled in the use of a lantern, and know just what risk he takes, and the consequences of an explosion, just as much as an engineer when undertaking to run a steamboat. Millar Bros.

When speaking to an audience, raise the voice to such a pitch, as though you were addressing an individual seated at the far end of the hall.
J. Bruce Bryce.

Condensers and Experiments with the Lantern.

By Thos. Fletcher.

Mr. W. H Harrison, writing in December Journal, in which he recommends the triple condenser, evidently forgets that this form, although useful for common slide showing, is very objectionable when the lantern is used for physical demonstrations.

The showing of pictures, good or bad, is not the sole object of the lantern, and it is a method of use which must eventually become of secondary importance. Even at the present time an entertainment which is devoted entirely to physical and optical experiments with the lantern, will draw a crowd, when a slide showing performance will, under the same conditions, bring together a very meagre audience. Of this I have myself had ample experience.

If the double plano convex condenser is used, the front of the apparatus can be made to swing back, the front half of the condenser removed, and put in the vertical arrangement, without the necessity for shifting the lime dangerously near the condenser, dispensing also with an extra condenser, and the consequent loss of light.

It is a very easy matter to make any new lantern so that it can be adapted for chemical, physical, and optical experiments; and it is a mistaken policy to begin to construct a lantern in such a manner as to limit its power to picture showing. Let any of the ordinary exhibitors of slides get up an amusing series of experiments with the lantern, and he will at once appreciate the difference in both the number, and the interest of his audience.

With a divided condenser, two mirrors, and a box, a first rate vertical arrangement can be made, costing very few shillings. With this, writing and sketching on an oiled ground glass slide, living insects, magnetic experiments, opaque objects, such as botanical specimens, and many other both amusing and interesting effects, can be provided with the greatest ease.

Any one who can sketch well with the pencil can create an endless source of amusement, and with this arrangement it is quite as easy to sketch in the lantern as out of it, in fact it is easier, as drawings can be made any side up and turned round.

A comic sketch done upside down, and then turned over, acts like a charm, and a live fly enlarged to 12 or 18 in. long running about and performing his toilet in public, has a charm far greater than the finest slide ever painted.

To Obtain Various Colours on Lantern Plates.

By Walter E. Woodbury.

It has always struck me that the colour of lantern slides usually shown on the screen rapidly becomes so monotinous that one soon loses all interest in the pictures themselves. As a rule, we get cold blacks and cold blacks until we should hail a bright crimson or a pea green with a cry of joy and a sigh of relief. It was with this idea that I set about making experiments with ordinary lantern plates, to see what variety of colours could be obtained—these being the ones generally used—although with the new printing-out plates there is no doubt that there will be a marked revolution in this respect.

The results of my experiments are here given. I do not say that all the tones are good, but they serve to show what can be done in this respect. The plates I used were the Paget Prize Plate Co.'s new slow lantern plates. Developed with ferrous-oxalate a perfect cold black is obtained. Pyro rodinal, eikonogen and amidol all give good blacks of different descriptions. But with the hydroquinone the greatest variety of tones is obtainable. The formula is—

Solution 1.

Hydroquinone	½ oz.
Sulphurous acid	¼ ,,
Potassium bromide	60 grs.
Water to	40 ozs.

Solution 2.

Caustic soda	½ oz.
Sodium sulphite	2½ ozs.
Water to	40 ozs.

By use of equal parts, brown, black results; by increasing the exposure, and using only half the quantity of the hydroquinone solution a nice brown is given. By altering the exposure and the quantity of the hydroquinone in varying proportions a number of browns are possible. By the use of the third solution recommended, however, a very large variety of colours come within our power. This solution is made up of—

Solution 3.

Bromide of ammonium	1 oz.
Carbonate of ammonium	1 ,,
Water to	20 ,,

By exposing the plate behind a negative of ordinary density for, say, a minute, about a foot from an ordinary fish-tail gas burner, or to about two inches of magnesium wire burnt at a distance of 3 feet, a brown colour is obtainable if developed with one ounce of each of the two solutions and 100 minims of No. 3 solution.

By giving an exposure of ninety seconds or three inches of magnesium wire, and using as a developer one ounce each of No. 1 and No. 2, and 200 minims of No. 3 solution, a purple brown is the result.

By exposing three minutes or burning three inches of magnesium wire at two feet distant, a red colour is produced by developing with one ounce of No. 1 and No. 2, and 250 minims of No. 3. This red colour afterwards changes to a bright purple.

With an exposure of five minutes or five inches of magnesium wire at two feet, and a developer comprised of solution 1, half ounce; solution 2, half ounce, and solution 3, 300 minims, a yellowish red, changing or drying to a bright red is the result.

The time taken in development is, of course, rather long. The purple and red colours will require from fifteen to twenty minutes. It should also be noted that these colours being red and yellow on development are hardly discernable by a red light, so that only a faint image when viewed by transmitted light is discoverable. With the larger exposures, daylight can be used.

Instead of hydroquinone, pyro and ammonia can be used with the No. 3 solution a slight variation in the colours is noticeable.

A further variety of colours is obtainable by immersing the images I have shown how to get, in a weak solution of bichloride of mercury. The brown turns to a bright blue black, and the others are changed in various ways.

By toning, other colours are under command. Various toning baths act in different ways; a rich blue-black is given with the sulpho-cyanide bath made up with sulphocyanide of ammonium thirty grains, gold chloride two-and-half grains, and water 16 ounces. The toning action is rather slow to obtain the blue black. I usually lay the plates in the solution at night, and remove them in the morning. There are of course other methods of toning much more rapid in their action.

Finally, we come to colours by intensification. The permanency of these is very doubtful, but some rich colours are obtained by bleaching the plate with mercury, and intensifying with hypo, sulphite, ammonia, silver, etc.

I am continuing my experiments, and hope in a future article to give methods of obtaining a still further variety of colours.

——:o:——

If lanternists in general would ascertain, before "lighting up," that their condensers are not cell bound, we should not so often hear them complaing about the back lens of it becoming cracked. Andrew C. Cole.

How to Make a Lime-light Box.

By Stanley G. S. Dicker.

Now that the dark days are with us again, and the camera has been laid aside, by the majority of workers, until next spring, those who have lanterns—and their name is legion—will, no doubt, be called upon by their friends for entertainment during the long winter evenings; and the lantern slides made from last summer's negatives will be produced and shown upon the screen. But occasionally the lime-light lanternist is called upon to assist at entertainments other than those at which slides as shown. For instance, who has not, at one time or another, been asked if he cannot light up tableaux vivants, shadow pantomimes, or amatenr theatricals with his lime-light lantern. As I fancy a want of knowledge as to the capability of his instruments causes him sometimes to reply in the negative, it will be my endeavour in this paper to explain how easily and cheaply a lime-light box may be extemporised or made.

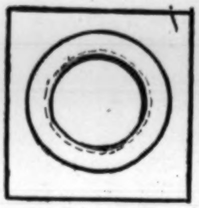
Fig. 1,

In the first place the lantern itself may be converted into a lime-light box in a very few minutes. Of course the objective must not be used, neither will the condenser in its usual form answer the purpose. First of all remove the front of the lantern, including the slide or carrier stage if possible, now take out the condenser and remove one of the glasses, leaving one in the metal rim with its convex side facing outwards, this forms a very good lime-light box. But I do not altogether advise the conversion of an optical lantern into a lime-light apparatus as it is, as a rule, subjected to considerably rougher treatment than an ordinary lantern should receive, and, at times when the jet has to be appproched very near to the condenser, there a considerable risk of breaking the glass, besides the further risk of scratching, which would render a condenser unfit for general lantern use; so that it is preferable to make a regular lime-light box, to adapting a lantern to that purpose. These boxes though they are expensive articles to purchase (owing to the comparatively small demand for them) can be made for a small sum, the principle item of expense being the condenser. I will describe how I made my own box, which has given every satisfaction.

In the first place we will take the lens or condenser. This should be a 6-inch single plano-convex lens of very short focus. These can be bought for about 12s. 6d., but as a few scratches or a crack will not materially effect it, a second hand condenser can often be purchased for a shilling or two. Now take a piece of sheet tin 10-inches square, and cut out a central hole 5½-inches in diameter. Then cut a ring of the same material 6½-inches in diameter with a central circular opening 5½-inches, Fig. 1. Place the condenser (convex sides downwards) in the hole in the square piece of metal so that it rests in it, overlapping the edge ¼-inch all round; now place the flat ring over it, and solder the outer edge to the tin underneath.

Now take a piece of black Russian iron 36 inches long by 10-inches wide with the edges finished by turning ⅛-inch over. Cut through for a distance of 1-inch on one of the long sides at 3, 13, 23 and 33-inches from the end, as below, Fig 2, the cuts being shown at *a*, *b*, *c*, *d*.

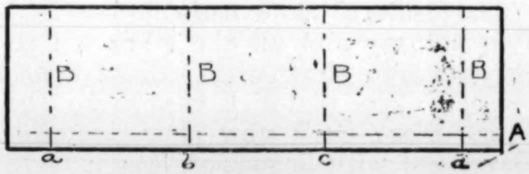

Fig. 2.

Then turn down this side at right angles as far as the end of the slits or cuts—i.e. on the line A.A. Proceed to bend this sheet round the condenser frame on the lines B. B. B. B., letting the bent over parts overlap the outside of the frame, thus forming a box with the condenser at one end, quite open at the opposite end and with an opening of 4-inches on the under side, as in Fig. 3. Four rivets at *e*, *e*, *e*, *e*, will serve to fasten the condenser frame to the case. Attach to the bottom of the box a piece of ½-inch mahogany 10-inches square, slightly turning up the edges *f*. *f*. in order that the jet tray may slide under these edges and upon the board.

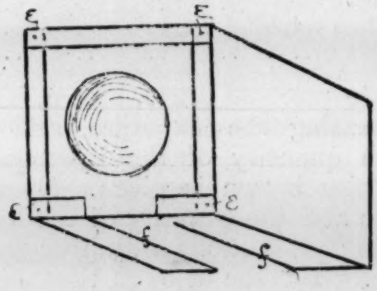

Fig. 3.

The box is now complete, and there remains the stand to be made. This can be constructed very cheaply out of some gas piping and an old gas bracket. Take an ordinary single jointed gas bracket, Fig. 4, remove the nut and washer *g*, file down the part *h*, and the sides *i* of the part *j*, so that the globular part *j* may rest against the knob *k*. Then get the ironmonger to put a fair sized wing nut on the end of the stem *h* which passes through *j*, so that by

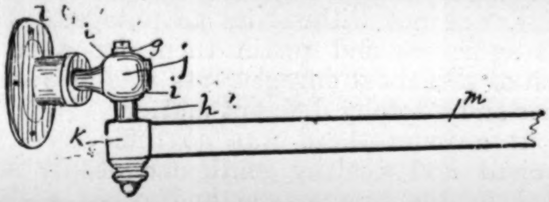

Fig. 4.

screwing up the wing nut the parts *j* and *k* are clamped in any desired position. (See Fig. 5.)

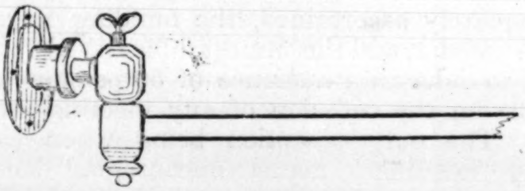

Fig. 5

Attach the base *l* to the bottom of the limelight box, and insert the rod *m* into a 6-foot length of gas barrel, in which it can revolve easily, but not too loosely. About 4-feet up the gas barrel solder a strong flattened ring to which to attach guy ropes extending from this ring to four hooks screwed into the floor. When the apparatus is finished it should look something like the sketch below.

Either a blow-through or a mixed jet can be used, for most purposes the former will suffice. The circle of illumination is controlled by moving the light nearer to or farther from the condenser, the smaller the circle of light the more intense it becomes. By loosening the wing nut the box can be pointed either upwards or downwards and clamped in any desired position, whilst a side-way movement is obtained by revolving it on its pivot in the tube.

Various coloured screens to be held in front of the condenser, can be made by enclosing 6-inches squares of thick coloured gelatine between two frames of cardboard. These are both lighter and cheaper than glass, besides offering a larger selection of tints.

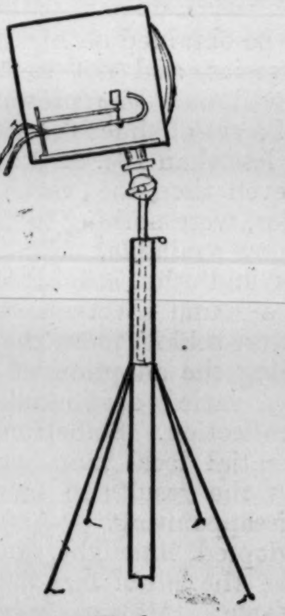

Fig. 6.

The Lantern as Applied to Medicine.

Mr. Andrew Pringle, in the course of a lecture at the Lantern Society, said that "the chief advantages of photography applied to medicine are, firstly, as a means of record, and, secondly, as a means of demonstration and teaching." Photography as a method of record is by no means a new idea. It has been in use for a number of years for recording facts, not only in medical science, but in every other science. Several large schools in London and elsewhere are now using the lantern as a method of demonstration and teaching, with great success both to teachers and pupils. At a lecture given some time ago I was pleased to witness the enthusiastic way in which this method of demonstration was received. It is all very well for a professor or teacher to prepare a large number of collections and to place several microscopes on tables before a class of students, but it is utterly impossible to expect that those collections shall be in every respect equal to a demonstration of the same object in the lantern; or to expect that the students will all be looking at the precise thing under notice. Consequently when we resort to such a method of demonstration as the ordinary lantern—more particularly when the production of the modern slide follows—we have such advantages as cannot be equalled in any other process known to us. I contend that the lantern has the strongest possible claims upon our attention as the best method of demonstrating medical facts. I have numerous slides to illustrate various uses of photography and the lantern in medical record and in medical education.

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How to Get, Please, and Retain an Audience. No. I.

By E. Baker (Salisbury).

Possibly the first exclamation of the reader will be one of surprise that in this, as in many other enterprises, certain conditions must be carefully fulfilled if adequate results are to be attained.

It may at least disarm prejudice in the minds of some highly successful brother lanternist, if it be frankly stated that some of the incidents related in this brief gossip have occurred during an experience of close upon a quarter of a century, and that, too, with almost every form of light which science has devised—each in turn, however perfect, having been in some degree supplanted by improvements either in form, brilliancy of light or portability, until the advent of compressed gases with the helpful accessories of perfected jets and regulators, without which no operator is "up to date," leave nothing to be desired.

My early experiences by way of introduction will not be regarded, I hope, as a digression, presenting, as some of the incidents do, features so ludicrous that my story would not be complete without them.

When looking back upon the period far away in the fifties (not to be too precise), there are stored up in the memory, visions of smoke and smell, with other objectionable elements connected with early lantern displays, to be succeeded a few years later on by a determined purpose to turn this mode of entertainment to some practical account. It was at this stage that an article appeared in the *Christian World* which must have been of immense benefit to the gentleman whose name was associated with it, as an impetus to business, in which the writer sought to indicate the methods by which, with the aid of a series of lantern pictures on popular and attractive topics, working men might be allured from the attractions of the public-house, while other advantages were earnestly advocated, and the certainty of practical results pointed out.

Here, at all events, was the suggestion which became the outlet for some degree of enthusiasm, and acting upon the hint, as doubtless many other readers did, that further information should be obtained from the name cited or some other optician, it was perhaps natural that the person whose name was given obtained the benefit of what appeared to be a gratuitous advertisement. Very possibly a "peep behind the scenes" would have revealed the conditions under which the article was inserted.

The result was the possession of my first practical lantern. But, Mr. Editor and fellow lanternists, it was not an elegant bi-unial or triple mahogany oxy-hydrogen instrument, such as figures in our journal, resplendent with brass fittings, but a modest tin body stereotyped form of lantern, with "Solar lamp" of 30 candle-power. How I look back up on that interesting espisode in lantern experiences, and wonder how, for a single hour one could tolerate the greasy, messy, troublesome apology for an instrument which was to revolutionize the means of giving helpful instruction and amusement in an attractive form. This certainly never became with me a solution of the question, "How to get an audience," and it was soon determined that "light, light, more light," must be the watchword.

It will not be understood that for household or domestic used, the amusement of the family, or a circle of admiring friends, the lamp described, with which many old lanternists are familiar, was not without its advantages. To secure audiences and retain them for a succession of periodical engagements was however another and a totally different matter.

About a room there was no difficulty. A benevolent and wealthy gentleman deeply interested in the temperance and other social movements purchased a building, which with the aid of the architect and the builder was readily transferred into a really excellent hall, accommodating some 250 to 300 persons. By some means however, for no reason that could be adequately ascertained, the building never became popular, and the utmost difficulty always existed to induce an audience of 50 persons to assemble on the occasion of any meeting held there. The only exception being when the "Penny Reading" mania encouraging local "talent" gave an impetus to the attendance. Beyond this, temperance meetings, "Good Templar Lodges and Sunday afternoon services," only secured fluctuating and very scanty audiences. There was little difficuly therefore in inducing the executive to grant the use of the hall free of charge, surely a first and a very powerful inducement to make an energetic start.

Here it may be observed that I had no intention of passing as a public benefactor and so working the thing at a loss; at the same time I had no desire to realize a profit by the undertaking. Without therefore the means or the inclination to sustain a heavy loss, it became evident that unless radical changes were adopted the balance would be very speedily on the wrong side.

Slides were not then to be obtained on hire at 3s. or 4s., for a lecture series, and not to be purchased at much below double the present charges, the usual cost of a set of slides for the evening then, was rarely less than 10s. or 12s., including carriage, and even then the variety and character of the slides, were nothing to be compared with what are now available.

This item added to bills, and other announcements, generally meant a round sovereign at least, while the proceeds were seldom more than 8s. to 10s., notwithstanding the adoption of a less charge for admission, varied occasionally with free tickets, and a collection. Sometimes the presence of an influential local man was secured as Chairman, but the results in most cases were more or less dissappointing.

By this time I had adopted limelight, and was vain enough to believe the bill of fare provided was fairly creditable. Matters were assuming a very unpromising aspect when the thought occurred that it might be useful to import a sensational element into the business.

Acting under the most profound secrecy, an advertisement was inserted in the local paper for three weeks, the first being—"Wanted, 100 Working Men—see next week." Numerous and widespread enquiries at once arose as to the possible object for which so large a body of stalwart men could be required. The next week scarcely cleared up the mystery, though some began to see a veiled joke—"Wanted, 100 working men and their wives." No one meanwhile had been entrusted with a solution of the mystery, which was soon dispelled on the appearance of the third advertisement which added—"To spend a pleasant evening at the Temperance Hall, when three hours' real enjoyment, with music and speeches, pictures and recitals, coffee and cake, tea, cocoa, and biscuits will be interspersed, the charge for the whole being fourpence." The unpopularity of the place of meeting notwithstanding, the hall was soon packed from floor to ceiling, and that not as the result of the "feed," as might be supposed, for all expenses were cleared and a trifle profit made; but the great point gained was to familiarise a large number of the very class it was desirable to meet, with the objects of the meeting, and to convince them that the Temperance Hall was not, after all, such a dreadful place.

Future plans were discussed, and a hearty spirit was manifested by some, at least, who were from that period warm supporters of the movement. The balance against the treasurer on the earlier incidents remains to this day; but there was no further difficulty in conducting a long series of fortnightly meetings without the sensational elements employed to popularize them at the crisis when abandonment seemed inevitable. The memory of those pleasant evenings for the people in a town long since ceasing to be my residence, is still a cherished memory of the past; but as this paper has already far exceeded its intended limits, I will, by the Editor's kind permission, defer another element that deserves consideration, viz., "How to retain an audience," till the next number.

(*To be continued*).

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Let me give one word of advice to all who use saturators of any kind. Never attempt to light up a second time, until you have disconnected your tubes and blown through them. E. H. Stevenson.

The firm of Orchard was the first to condense gas commercially, but the pressure was only 600 lbs. or 40 atmospheres. R. R. Beard.

Autotype Lantern Slides.

By Geo. Kilburn.

The term autotype is understood to mean the reproduction of any artist's work in monochrome. The only means employed being the natural forces of light, chemical affinity, and permanent pigment.

The base of the process is the action of light upon organic matter in presence of bichromate of potash or ammonia.

The pigment tissue may be obtained in a variety of colours, and I would advise beginners to buy it (Autotype Co., London) ready made, but unsensitzed, as after sensitizing it will not keep longer than two weeks at the outside.

Having obtained the tissue, cut it up into the desired sizes, and put under pressure for a few days before sensitizing, so as to ensure its lying flat.

The sensitizing bath is made as follows :—

Bichromate potash	1½ oz.
Meth. spirit	4 ,,
Ammonia	1 dr.
Water	30 oz.

A sufficient quantity should be placed in a dish at least an inch deep, and the tissue laid upon it as in the manner of floating albumenized paper, but as soon as it is thus floated on, it should be pushed under the fluid by the aid of a camel-hair brush, by which means any air bubbles may also be brushed off.

The tissue should be turned over in two minutes and brushed in all directions, and in one minute more lifted out and drained. It is well to let a few drops of the fluid fall upon the zinc or glass upon which it is then squeezed, until the back of the tissue is surface-dry. Remove the sheet and hang up to dry in a darkened room.

Before printing, it is desirable to ascertain its degree of sensitiveness by means of an actinometer. A mask a trifle smaller than the lantern slide should be put on the negative, and then the tissue, placed behind, and exposed in accordance with its sensitiveness and density of negative.

A support or glass must now be prepared by thoroughly cleaning, and coated with a substiatum (Nelson's No. 1 gelatine one ounce, water twenty ounces. Soak the gelatine in cold water and dissolve by gentle heat, then add sufficient bichromate to give a sherry colour) and dried in daylight.

Place a piece of exposed tissue upon the support which has thus been coated, and immerse in a dish of cold water, avoiding air bubbles. The tissues will begin to curl up at the edges, but when again flat, raise it, together with the support, and run the squeegee over it to impart contact. It should then be laid aside, for say, ten minutes.

To develop, place the tissue with its support in hot water of 100 deg. Fahr., which soon causes the gelatine to ooze from the edges of the paper, which can then be removed gently from the plate and thrown away. The gelatine left on the plate is gently washed, and in a few seconds the picture will begin to show itself.

After the soluble gelatine has been washed away, the development is stopped by being placed in cold water, and then fixed in a solution of water containing 5 per cent. of alum, which removes the bichromate salt. Keep in this solution until all yellowness has been removed. After a rinse in cold water the finished picture may be placed on one side to dry.

If it is found that the tissue will not adhere to the glass support, the cause may be looked for in the potash being too acid, drying it too slowly, light not being altogether excluded or the tissue being kept too long after sensitizing.

To those interested in making slides by this process, I would advise the perusal of a little book, the "A.B.C. Guide to Autoype," issued by the Autotype Co., London.

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Oxygen—Good and Bad.

By T. C. Hepworth,

Author of the "Book of the Lantern," &c.

The employment of oxygen for the lime-light and other purposes, has increased enormously since the commercial introduction of the Brin method by which the gas is separated from atmospheric air by a now well-known chemical process. The gas so obtained is practically pure, analysis showing that as now supplied by the Brin Companies it contains on an average 95 per cent. of oxygen, the remaining 5 per cent. consisting of inert nitrogen.

The success of this comparatively new industry has been so marked, that, as a natural result, competitors with rival processes have come forward. Some of these met with failure at an early stage of their career, but others are supplying oxygen to the public. This is by no means a state of things to be deplored from the consumer's point of view, if the product from the one source is as good as the other, for benefit generally arises from healthy competition. But when a rival product turns out to be, not oxygen, but a half and half mixture of oxygen and air with a slight excess of the latter, the competetion is of a decidedly unhealthy character, and is correspondingly bad for the consumer. I recently obtained a sample of gas from a dealer, which on testing (with a Hempel absorption pipette charged with metallic copper and ammonia) I found to be a mixture containing only 60·6 of oxygen. I next tested the illuminating value of this highly diluted oxygen with a lime-light jet, and for sake of comparison, placed by its side a precisely similar jet supplied with Brin's oxygen and, as might have been expected, the light given by the former was little more than one-half as intense as that afforded by the latter. With the good oxygen the lime was quickly pitted, whilst the other showed no symptom of destruction. It is also to be remarked that the consumption of the diluted gas is, for a given period, about one-third more-striving with both jets to get the best possible light—than that of good oxygen. On the same principle, a mountaineer at a high altitude will pass more (rarefied) air through his lungs in a given time, than he will when he is in the valley breathing that which contains the normal quantity of oxygen.

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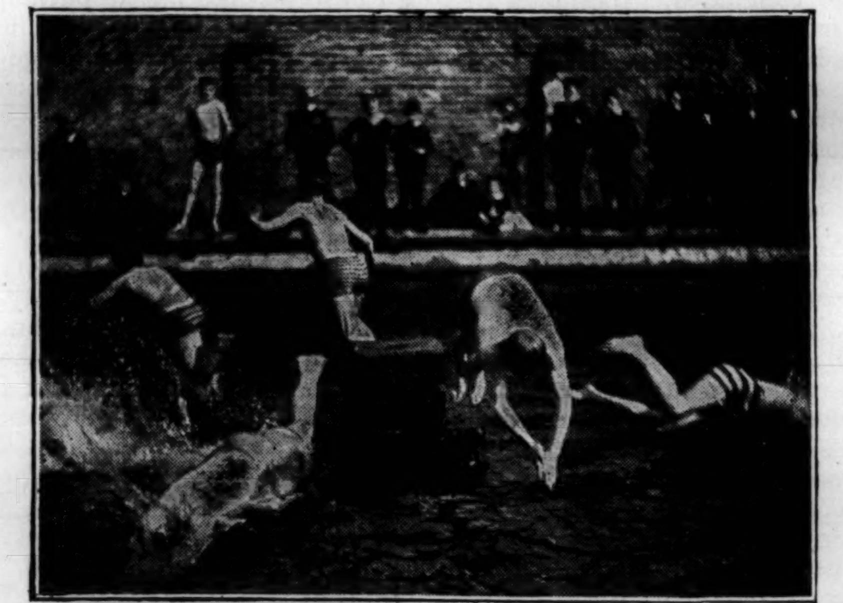
New Apparatus.

Hand-Camera Lens.

A lens of the size shown in cut is being made by Messrs. Taylor and Hobson for hand-cameras. It is supplied with rack and pinion, and also an iris diaphragm, which is operated by revolving the front rim. The traverse of the rack is 0·4 inch, and the scale of distances can be engraved upon the sliding tube.

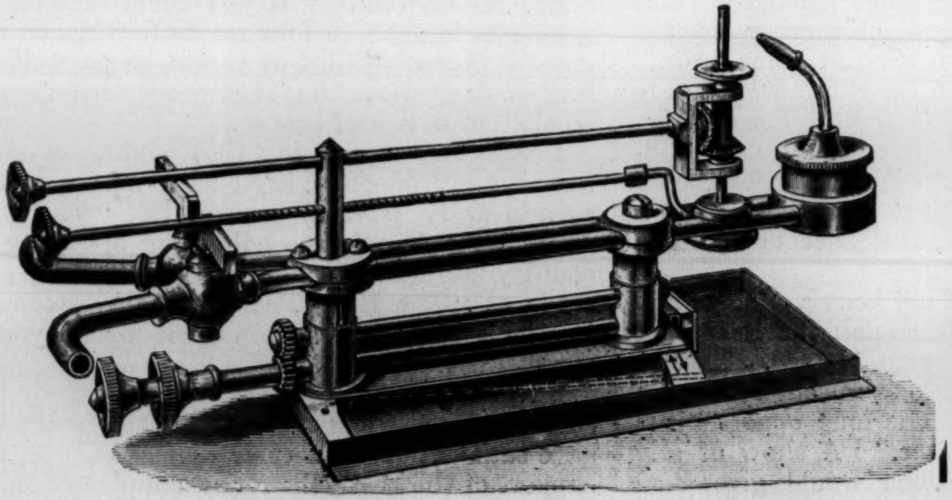
Shutters.

Since the Thornton Pickard Manufacturing Company have settled down in their new factory at Altrincham, near Manchester, they have still further perfected their famous shutters, until they have now a shutter with speed indicator which will expose a plate as quickly as one could desire. From a number of pictures exposed with this shutter we have selected for an illustration the following picture. The positions of the subjects preclude the possibility of any but a very quick exposure being given.



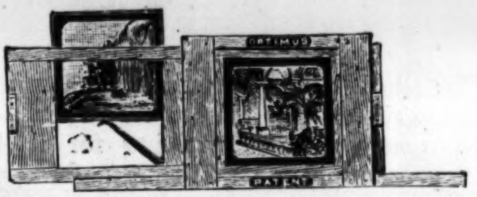
Centering Jet.

In our article in last issue on centering the limelight we omitted to show the following illustration of a jet introduced by Mr. W. C. Hughes. At the back will be found two milled heads, one of which raises and lowers the jet; whilst by means of the other a slide motion is imparted, thus rendering the centering from the back of the lantern a simple matter.



Slide Carrier.

Mr. James, of the Lewisham Camera Club, has invented a carrier which lifts up the slide after having been shown on the screen, so that it may be grasped at the edge and removed

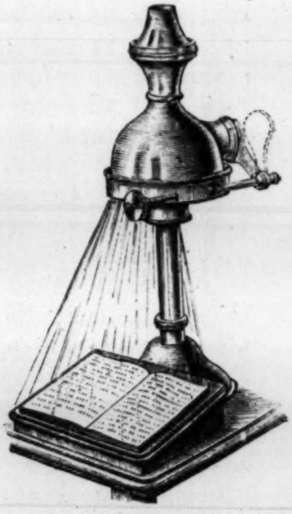


without having to place the finger on the glass. It is automatic in its action, and is being introduced by Messrs. Perkin, Son and Rayment.

Lecturers' Lamp.

A new lamp has been brought out by Benham and Froud, styled Lecturers' Candle Lamp. It burns a special form of hard candle,

Packed.



Open for Use.

and the upper portion of lamp forms a reflector, by which the light is concentrated upon the manuscript or book, as shown. When packed, this lamp forms a very portable package. By turning a knob placed conveniently in reach of the lecturer a red light can be shown as an indication to the lantern operator to change the slide.

"My First Exhibition."

A FRAGMENT.

By J. G. Bennett.

The catchword craze, I presume, is at an end; and although the writer joined the blood-thirsty spirit of the times, in order to accumulate wealth without working for it, he concluded, some months back, that such a game of chance was scarcely worth holding a candle to. The skill and judgment part of the argument wouldn't go down with the learned magistrate, and he has dubb'd the whole business a lottery, purely a game of speculation. Looking at the matter logically, one is not surprised at the decision arrived at. One journal alone states that over half a million shillings had been received in one competition. That dozens of editors even to a photographic editor were following in the wake, everyone knows, and that all descriptions of the chicanery art would have very soon, without doubt, developed themselves in ways both cunning and mysterious. The ethical side of the argument remains as it was—that it is unlawful, morally, to induce the community to set up a mania for gambling. But not to be too nice, and without moralising further—" Is the 'missing word' dodge the only game of chance my brother lanternists have indulged in? I think not." Of course, my personal feelings rise uppermost, as I sit to jot down in writing what may have happened to scores of lantern lovers.

Not many years ago the successful amateur in question terribly deceived himself that his talents were the proverbial hidden ones under the bush. That wider scope than the drawing-room or the humble school-house afforded, could be had for the asking—that he had but to advertise to the world, that so-and-so was coming with his unique exhibition—"To the South African diamond fields and home again," that "all the world and his wife," were ready to rush to embrace him, to load his clothing with the gems he had so much talk about, sending him away, coffers stocked with gold, only to look forward for the next tour, that the welcome might be repeated, that success would be crowned with success.

Considering there had not been a show of any kind in the town of Brocknell for fully four months, here was the very chance. Twelve thousand inhabitants without an entertainment for so long a period. Glorious opportunity! "Nothing could be better." A show of any kind under such conditions would give good results. But when it came to a "Lantern Exhibition," the question was decided. But stay! "Is there a building in the town capable of accommodating a fairly sized audience? Happy thought! Consult the pages of the *Era?* and as this did not advance matters, the next course was to telegraph to the principal agent of the district. The first letter (or for the matter of that, each letter) received from that gentleman was digested with a relish that cannot be described. There was a freshness in his diction, a thorough business-like way of putting things, that at once stamped him as being a fit and proper person to undertake the management of the undertaking. So it was in response to a pressing invitation "to see the place for yourself," that I journeyed to Brocknell, and was gratified with the prospects. "You see, my dear sir, the Town Hall is all very well in some lines of business," my manager remarked, in reply to a questiou I put to him, "a Variety Show. The Lion Comiques and Company, or things of that nature, do well there, but when this poster is set up," he continued, as he glanced at the draft in manuscript of a poster I had written out at his suggestion. "When those words 'Synopsis of Scenery' are printed in red block letters, and," he went on, 'The Powerful Oxy-Hydrogen Light' in blue, it'll catch the very people you want. The county families and swells won't go to the Town Hall." "But I was thinking of the seating capacity," I said. "Same, my dear sir, as the Assembly Rooms. I beiieve there is a difference of five, and which side it's on I'm sure I can't remember, but I think you'll find it's Hall, 530; Rooms, 535." So it was decided to book "The High Peak Assembly Rooms for the 29th of March, or five weeks hence. "Good-bye, my dear sir," said my manager, as he shook my hand at the carriage window that same evening after having completed the arrangements to my entire satisfaction. "If you could manage to run down in three or four weeks time when the place is properly billed it would be as well, as further suggestions that may occur to you could be chatted over and arranged."

I was late in retiring that night, as after reaching my diggings, tired as I was, I had a private (very private) rehearsal of "The Diamond Fields," and then fell asleep dreaming of country families, gas-bags, and an explosion and panic at "The High Peak Assembly Rooms." It was a busy and anxious time for the young entertainer.

Advertisements were freely circulated in the surrounding districts of Brocknell, the local press gave satisfaction with their displayed type, the support of the best folk for a couples of miles around, including the vicar, had been solicited; everything, in fact, had been done that could be done. Wilding, the operator, was a man well up in his work, and as sanguine as was he who was to leap at one bound into notoriety.

On our arrival at Brocknell we noticed the Town Crier had been engaged for the day. He carried in his hand for guidance a programme, but some of the sentences somewhat fogged his articulation, which, however, was excusable.

The manager was delighted to meet us. "Such favourable weather, my dear sir. nothing could be better. I wish you well, I'm sure, and only regret pressure of business will not permit my being present; I've to leave by the six train to meet a gentleman I've catered for for years, and who I have an appointment with in Buxton. Nothing has been left undone, my dear sir," he went on, arranging at the same time his memos of accounts ready for my perusal, "to ensure your comfort and, I trust, success. And should you wish a flattering report in our influential weekly just dot it down and forward to me by Thursday, and I'll vouch for it's insertion."

I explained that the arrangements had been satisfactorily carried out.

The climax is brief. That man was never in the town when the place of entertainment was open. There was no business. I afterwards learned that I had chosen absolutely the worst possible place I could for making my *début*. I had paid dearly for a never-to-be-forgotten experience. The exhibition did not take place, for, waiting half-an-hour after the time announced to commence for an audience to put in an appearance, we returned the three solitary sixpences to the only three sensible people that had honoured us with their presence, packed up the apparatus, and left the building in disgust. I need scarcely add "The High Peak Assembly Rooms" have not seen me since, and won't.

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The Lantern of the Future. No. I.

By W. H. Harrison.

At the conclusion of the first part of this article, the trial of common gas saturated with crude unrefined coal-tar benzole, supplied to three-ring argand burners furnished with glass chimneys of the shape used by Trinity House was recommended, and reasons given. This will necessitate the use of an excessively long and perhaps somewhat narrow glass chimney, the proper length of which can be ascertained by trial with the particular burner. With a two-ring burner such abnormal length will not be necessary. A convenient way of getting this abnormal length is to use a glass tube of normal length, and drop over part of it a suitably long iron or brass tube, loosely stuffing the space through which the latter surrounds the former with asbestos, so as to prevent the free access of outside air to the space between the tubes. The two tubes can be kept in position by means of a support on the retort stand principle, or by other contrivances. Because of the condensation which takes place upon mixing gas and benzole vapour—somewhat unexpectedly from a chemical point of view—there is no economy in burning gas so charged, as there is by the common plan of charging it with napthaline; but in lantern displays the greatest possible amount of light is wanted in the smallest possible space, and the trivial extra expense just mentioned is not worth consideration. A suitable way of saturating the gas is to pass it through a strong metal vessel, with a good wide mouth, closed in an air-tight way with a bung or other suitable stopper. The gas from the main should enter this from a tube passing far down into the vessel, until it nearly touches the liquid at the bottom thereof; another tube should just pass through the bung into the upper part of the vessel, and by a flexible tube be connected with the tap or taps of the burner. The upper part of the vessel containing some benzole at the bottom should be filled with the driest possible fine shavings, to take up the liquid benzole like a sponge, and present a large surface for charging the gas with the vapour. This saturator should not be placed where it will get hot, but preferably on the floor rather than near the lantern. No explosion is possible with this saturator unless air should get in, and then one of no great violence, but sufficient perhaps to blow out the bung, which thus acts as a safety-valve. When pure oxygen instead of air gets mixed with gaseous hydrocarbons the conditions are far different as regards violence of explosions. If the vessel be air-tight, and the gas be turned on at the burner a short time before it is lit to clear most of the air out of the pipes, there will be no fear of the flame running back. Gas charged with benzole vapour has been used in times past for household illuminations. These remarks are merely suggestive of a line of experiment, to ascertain whether in this way a brighter flame than is given with paraffin can be obtained with common gas. As previously stated, good oil-gas gives a much brighter flame than does paraffin.

Trinity House uses a far better paraffin, with greatly higher flashing point, than that ordinarily on sale to the public, and it might be well to try whether such oil is perceptibly advantageous when used for the lantern.

In the first part of this article some minor points relating to condensers were not stated, and may as well be inserted here. In a triple condenser the meniscus element nearest to the radiant must be smaller in diameter than the other two lenses in the triplet; if it be made of the same diameter for the sake of convenience in mounting, that means that it is correspondingly thicker at the centre, and the thicker it is the more liable is it to crack by heat, and the more light does it absorb. Another point is that each lens in the condenser shall have a thin edge, almost sharp; if it does not it signifies that the lens is thicker than necessary. Lenses with their thin edges slightly rounded off and polished are good, because any trace of a crack at the edge can then be seen. A crack at the edge is liable to extend under the action of heat. A familiar instance of this is seen in the experiment of cutting a thick piece of glass with a red-hot poker having a thin end; a notch is first filed near the edge of the glass, and when the end of the poker is placed near it a crack starts to the end of the poker, and will afterwards follow the heated poker as the hot iron is drawn along the surface of the glass. A third point about condensers is that they shall be so loosely mounted as to turn round easily in their mounts; if they are tightly mounted they are liable to break when they expand under the action of heat. A fourth point about good lantern condensers is that there shall be holes in the mount for ventilation; it is annoying to get moisture between the lenses, which does not rapidly pass away by ventilation. A fifth point about a good condenser is that between the meniscus lens and radiant it shall hold a piece of exceedingly thin, flat glass, of which the operator has extra pieces to substitute quickly in case of fracture; this will tend to protect the more costly parts of the condenser from the action of sudden changes of temperature. It might be well if these flat discs were made of one of the special glasses used in the manufacture of glass chemical apparatus which has to resist the sudden application of heat. Sixthly, it is almost needless to say that every element in the condenser should be made of glass which has been well annealed. A seventh point is that the curves and focal lengths of the elements of the condenser shall be suitable for the class and focal lengths of projection lenses to be used therewith. Eighthly, it is not alone necessary that the meniscus nearest the radiant shall take in ninety or ninety-five degrees of light, but that none of this light shall be afterwards unnecessarily lost before it reaches the screen. Some of that light which is collected by the first lens may afterwards easily be lost against the sides of the mount and elsewhere in a badly constructed or badly designed triple condenser, which thus might be made to act no better than an ordinary doublet, as some authors seem to have found out.

A lantern in which gas or oil is used should have large air-channels, to freely permit the entrance of air and the escape of heated gases. There is more friction in the passing of gases through orifices than generally supposed, and this accounts for the uselessness of some of the toy developing-room lamps occasionally found in the photographic market. The flame is either bad from the insufficient supply of air, or, more frequently, extinguishes itself, or cracks the lantern glass, or sets fire to the red "fabric," because the upper orifices are too small to let the hot gaseous products of combustion pass out freely. These drawbacks are probably not introduced intentionally, but from want of knowledge, especially in the case of those among small mechanics, who think that if a lantern has a hole of any kind at the top and at the bottom all will be right for the flame and its surroundings. A three-ring lamp will consume a great quantity of air.

The heat of the metal chimneys, and of the tops of all magic lanterns, is intense, and it is remarkable that, so far as I know, this heat has not yet been utilised to increase the illumination on the regenerative principle, by supplying hot instead of cold air and gas to the flames. Some sort of metal jacketing of the chimney and upper part of the lantern would be necessary, or suitable metal tubing could be so placed as to heat descending air before it reaches the flame; oil reservoirs and the lower part of the wick would have to be kept well out of the way of this hot air. Evidently gas would be better than oil when the regenerative principle has to be brought into play. Will Mr. Wenham, or anyone else, give us a three-wick regenerating flame for the lantern?

In this article there has been much rambling from the subject to the right and to the left, for the purpose of recording suggestions which may serve as starting-points for inventors. It is time now to return to the main road indicated by the title of my memoir.

To sum up, a clear specification, to give something practically to discuss, has herein been put forth as to the construction of a thoroughly good standard magic lantern of the future, namely:—1. That it shall have a triple condenser of colourless glass, and preferably with an exceedingly deep meniscus as its element nearest the radiant. 2. That it shall be made to work with projection lenses, of not less than nine inches focal length, but shall give good results with such a lens. 3. That single-combination projection lenses shall be used. 4.

That the curves of the elements of the said condensers and projection lenses shall be calculated and laid down by a good mathematical optician, so as to best suit each other, and not be manufactured ignorantly by rule of thumb. 5. That the lantern shall be in two parts, completely separable and relatively adjustable at will, namely, the condenser and the radiant in the one part, the slide and the projection lens in the other part. 6. That the condenser shall be five inches in diameter, and the projection lenses not less than three inches in diameter. 7. That there is room for the exercise of inventive ability in the devising of improved burners of oil and gas for the lantern. 8. That as close behind the flame as a trumpet-shaped chimney will allow, shall be a small silvered reflector, which must be made of the proper curve to suit the position in which it is fixed with regard to the flame.

Probably with a good optical system, and with improvements in burners and illuminating agents, the present average brilliancy of disc given by oil lanterns can be more than doubled, all other conditions being equal.

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Lanternists in Australia.

By C. Mountford Allen (Queensland).

The perusal of the *Optical Magic Lantern Journal*, gives me much pleasure, and from its pages I learn endless new "notions." My principal reason for writing is in reply to a query from Mr. Lowe in the April number relating to coloured films, and as I see no mention of what I am about to say in either of the later issues to date, I think my practical experience may be of some service not only to the gentleman named, but to many others interested in lantern matters. I have made very satisfactory tinted glasses of all shades by using the Commercial Enamel Collodion with a few drops of the desired tint of Judson's dye, sufficient for the depth of colour required. Great care is necessary to have the glasses chemically clean, and care is also required in pouring on the collodion, as in photography. These glasses I have prepared as large as 10 by 8 for purposes of tableaux, and with very good results.

With regard to oil lamps at times burning badly I can endorse all that the Rev. W. H. Gregory says in the February issue, and found upon obtaining a current of fresh air the flame at once recovered.

Speaking of lamps, &c., how difficult it has become of late to choose any one lantern or lamp—so many and different styles are put forward, each and all of them claiming to be "the best" and the most powerful, &c. Really it's quite confusing. In this country, where travelling is not always easy, or the means commodious, an oil lamp—provided it is a good one—is the most convenient form of illumination.

I have read with much interest the articles by Mr. Stephenson, in March number, and Mr. Prowse, in September number, relating to small makes of lanterns, and I quite agree with the Vice-President of the Lantern Society in his remarks as to the unnecessary large size of lanterns, and hope that manufacturers will see their way to introduce a more compact and convenient form of lantern for both oil or gas.

It may be interesting to readers to learn that there are a great many travelling lanternists in the Colonies. They get permission from the State school committees for use of schoolrooms free, and from all accounts make a fair living. All makes of lanterns are in use—principally oil for convenience of travel, as often several miles have to be journeyed on foot from one Settlement to another, when the "kit" is necessarily reduced as much as possible.

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Editorial Table.

Slides.—We have received from Mr. J. W. McLellan 36, St. Pauls Road, N., a parcel of plain and coloured slides, and are of the opinion that Mr. McLellan can make a slide of very soft and pleasing tone. The tinted slides are very delicately coloured.

Catalogue.—We had heard a good deal about the catalogue that Mr. W. C. Hughes of Kingsland was about to issue, and have now received a copy. It is large, beautifully printed, and contains besides numerous illustrations of apparatus make by this firm, and a tremendous list of slides in stock, The "Docwra" triple, illustrated both front and back, is a fine imposing instrument, and is supplied with every movement desirable, including a new form of automatic flashing shutter. Altogether this catalogue contains 300 pages.

Opaque Screen.—Mr. F. Duran, 21, Turner Road, Handsworth, Birmingham, has sent us a sample opaque screen which we find to have a fine white surface capable of being sponged. It is very pliable and should meet with great favour among lanternists.

Lantern Slide Manual.—Hazell, Watson & Viney, (Limited), 2s. This manual by Mr. J. A. Hodges will be found very useful to those about to make slides, embracing as it does methods of illuminating the negative, also various processes by which slides can be made and finished.

Photograph Albums.—A neat and useful album to hold a dozen prints has been published by Percy Lund and Co. The photograph can be readily secured in place by slipping their corners under a slit made at each corner of the pages.

Correspondence.

LANTERN SLIDES OF LIFE AND CHARACTER.

[*To the Editor.*]

Dear Sir,—I am desirous of obtaining studies of life and character in all parts of the world, and although I know it is a tall order, yet I venture to utilise your columns (with your kind permission) to make known my yearning desire. First however, I don't want something for nothing, but for every slide sent me, an equivalent will be given. My offer is to give slide for slide. Any of your readers who may be in possession of hand-camera studies of street life, native characters or scenes, which will illustrate the particular country, I should be glad to hear from. I will exchange any number (not exceeding 18) slides of English street life and character, for a corresponding number from a foreign or colonial fellow-worker. Although hand-camera shots would be preferred as giving better renderings of life, yet, I by no means wish the series thus limited. My object is to form a set of slides of an interesting and instructive nature, which will be ready for use by next season. I should be glad to hear from any one in this country as well, who may possess suitable slides taken by them on a holiday trip abroad.—Yours faithfully, WALTER D. WELFORD,

47, Hagley Road, Birmingham.

MEASURING OXYGEN.

[*To the Editor.*]

Sir,—It may not be generally known to lanternists, who use only oxygen from cylinder, that they can dispense with and avoid the danger of pressure gauges by simple expedient of weighing their bottles.

When I first commenced to use the lime-light I purchased a 20-ft. cylinder, and having read of accidents with pressure gauges spent many anxious hours in trying to find some other means of knowing what amount of gas was in bottle.

I "wrote to the Paper" asking if any method was known, and one gentleman actually copied the table from Mr. Hepworth's book for my benefit. If these lines should be read by him, while thanking him for his trouble and courtesy, I must say he paid me a poor compliment as his information supposed I had a pressure gauge, and did not understand how to use it. While I was struggling with these difficulties I put this question to myself—has oxygen any weight? Fortunately the answer to this was easily obtained. I weighed my empty cylinder and weighed again when full and found it to be 2 lbs. heavier. I could then understand something of the joy of Columbus, for had I not also made a discovery. I have put this to the test for the past two seasons with uniform results, and now I never speak of feet of oxygen but of weight.

I find with my blow-through bi-unial the reduction in weight is 1 oz. every ten minutes, and I can always use up to within 1 oz., obtaining four exhibitions of 70 or 80 minutes from my 20 feet cylinder.

This may be well-known to many but probably some "Struggling Brother" may be helped by it and thank

Yours truly,

Long Eaton. GEO. YOUNGMAN,

(Particulars respecting ascertaining quantity of oxygen by weighing will be found in our issue of January, 1890, page 69.—Ed.)

Charitable Lantern Entertainment Society.—It is hoped that those readers who sympathise with its objects, will do what they can to assist the Society either by becoming members, or by giving a donation to the funds, or the gift of apparatus, or the loan of slides, would be very acceptable. The joint Secretaries are Mr. Foulkes Winks, 2, Pretoria Avenue, Walthamstow, and F. Simmons, 158, Frances Terrace, Herne Hill, S.E.

Notes and Queries.

Ibex writes: I wrote you some months ago about a defective bellows (Clarkson's) regulator, I took your advice, sent it to the makers, and have received it back in proper working order. I now want to know (1) if I can with safety use this wedge shape rubber bellows regulator on an oxygen cylinder (to which it belongs), and a regulator of a *different* type on a hydrogen cylinder, if not what precaution must I take (I mean of course to use them at same time with mixed jet)? (2) Furthermore I want to know whether in using a 40 feet hydrogen cylinder *full*, and a 20 feet oxygen cylinder partly emptied, and during the entertainment the oxygen should give out (be used up), is there any risk of a "blow up"? assuming, of course, as before stated, that Clarkson's bellows rubber wedge shape regulator is on the oxygen cylinder, and say a Suiter's patent regulator on the hydrogen? Your esteemed reply through the medium of *our* columns for January, will be gratefully received? *Answers.*—1, You can use the regulators in the manner you suggest. 2. No danger whatever, it is a matter of impossibility for the gas of one cylinder, to mix with that in the other cylinder.

Light Box.—Can you inform me where I could obtain a light box such as is used at theatres, also cost. I suppose the ordinary mixed jet will do? *Answer.*—Any lantern dealer will supply this. The cost complete with 6-inch condenser would probably be about £3. On page 6 you will find particulars of how to make a lime-light box.

H. Turton.—Your letter was overlooked last month, but you would have seen the information you required in our last. Letters for notes and queries should reach us as early in the month as possible.

F. T. Binks.—You letter of 24th November, was too late for December Journal. The fusing of the nipple is owing to the lime being too close to it. A very little distance further apart will prevent this.

Lime-light.—The best means of obtaining coloured screens is to coat glasses with Dalton's cold lacquer. This can be obtained in every tint and is merely poured on. It dries quickly and is very transparent. A good assortment would be blue, green, yellow, and red.

H. Roberts writes: Do you seriously mean in your answer to a letter in December Journal that I can place the letters S.O.M.L.S. after my name if I send you 1s. 6d. a year. *Answer.*—Yes, certainly you can if you please.

A. James.—Thanks for carrier, sorry we were out when you called.

Jas. Pettigrew (Melbourne), writes: I have got a number of subscribers out here for the *Optical Magic Lantern Journal*, they get them from the photo dealers, they all anxiously await each issue. Could any of your readers give a description of how to make a first-class oil lamp for a lantern. *Answer.*—We have numerous letters from your quarter of the globe. We will endeavour shortly to give a description of how to make a good lamp.

C. Mountford Allen (Queensland).—We have inserted your notes in this issue, and are at all times pleased to hear from our correspondents.

A.—Try Brunswick black diluted to the proper consistency with turpentine.

G. Orpwood writes: Will you kindly answer in Notes and Queries whether an opaque screen with ball and roller can be put up by means of a stand, most of our rooms being long and narrow; and we have seen lanternists show from side of room with screen slanted, but we cannot do this with screen fixed to wall, but should like to if possible. *Answer.*—Yes, you can place the screen on a stand and set it at an angle.

Dundee.—Too late, in our next.